CHAPTER 12: MONITORING GUIDELINES

The establishment of a comprehensive, efficient monitoring program is an essential component to the evaluation of project success. Through the establishment of success criteria, an effective monitoring program evaluates whether a project is achieving its goals and objectives. Monitoring programs are most effective when prepared for individual class-specific projects (as identified in Chapter 11: Project Implementation). It is at this focused planning level that project details and specifics are determined. As a result of the focused planning effort, monitoring programs can then be prepared to evaluate all specific aspects of the project. As identified in Chapter 10, every task requiring a management plan requires the establishment of a monitoring program to gage success.

At this time, developing project specific monitoring programs for each task identified in Tables 10-1 through 10-5 would not be effective. Detailed monitoring strategies and success criteria should be established as part of the preparation of an individual restoration management plan. Consequently, for every individual restoration project funded and implemented a detailed, comprehensive monitoring program shall be prepared. However, as individual restoration programs are implemented, it is critical that the general watershed objectives established in this ERP are followed. Consequently, for the purposes of this ERP, monitoring guidelines have been prepared to ensure that the general goals and objectives identified for each watershed are achieved. These guidelines are identified below for each area of restoration activity: water quality enhancement, vegetation community enhancement and establishment, and/or wildlife/fisheries population enhancement and establishment. The basis for this analysis is presented in Chapter 2: Methodology.

The guidelines presented in Table 12-1 shall be incorporated into the monitoring programs established for individual water quality restoration projects, vegetation community enhancement and establishment projects, and wildlife/fisheries population enhancement and establishment projects as identified in Tables 10-1 through 10-5.

Table 12-1. Monitoring Guidelines for Individual Restoration Projects

Monitoring Guidelines	Minimum Monitoring Timeframe
Water Quality Enhancement Guidelines	
All projects proposing to enhance water quality within the watersheds shall monitor for heavy metals, including lead, copper, zinc, cadmium, and mercury. Levels of each element may not exceed the limits of the California Toxics Rule (CTR). Data shall be submitted annually in report format to the implementation party.	Monthly
Sample for pesticide presence, including Carbofuran, throughout the watersheds. Pesticide levels throughout each watershed shall not exceed current EPA thresholds. Data shall be submitted annually in report format to the implementation party.	Monthly
Collect BOD data within each watershed. Data shall be submitted annually in report	Monthly

Table 12-1. Monitoring Guidelines for Individual Restoration Projects

Monitoring Guidelines	Minimum Monitoring Timeframe
format to the implementation party.	
Water temperatures within the watersheds shall be monitored regularly to avoid exceeding levels unacceptable to juvenile Chinook salmon and steelhead (20° C). Data shall be submitted annually in report format to the implementation party.	Weekly during periods of potential presence
Fish occurring in the lower portion of the Auburn Ravine basin shall be sampled for mercury concentration.	Monthly
Vegetation Community Enhancement and Establishment Guidelines	
Individual restoration projects shall incorporate into the management plan no less than a 70% survivability success criterion for each planting effort.	Annually
Individual restoration projects shall conduct annual plant species diversity counts to gage establishment of native vegetation within the restoration area. Each species shall be evaluated based on its dominance throughout the restoration site. Species, by strata, shall be assigned a rank of 0-5 as follows: • 0: Occurs in < 1% of the site • 1: Occurs in 1-10% of the site • 2: Occurs in 11-25% of the site • 3: Occurs in 26-50% of the site • 4: Occurs in 51-75% of the site • 5: Occurs in > 75% of the site	Annually
Estimated % cover of each strata within the restoration area shall be taken. The following definitions may be used: • Tree: Woody plants ≥3.0 inches DBH regardless of height • Sapling/Shrub: Woody plants ≥3.2 ft. tall but <3.0 inches dbh • Herb: All nonwoody plants and woody plants < 3.2 ft. tall • Woody Vine: Woody climbing plants ≥ 3.2 ft. tall Data shall be submitted to the implementation party and Placer County for use in preparation of the County's Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP).	Annually
General data to be taken during each monitoring effort shall include the following: • Average width of the riparian corridor (measured from edge of bank to edge of canopy), if applicable • Existing adjacent land uses	Annually

Table 12-1. Monitoring Guidelines for Individual Restoration Projects

Monitoring Guidelines	Minimum Monitoring Timeframe
• Presence of nesting birds • Canopy closure coverage, if applicable • Percentage (dominance) of native plant species within the restoration site Data shall be submitted annually to the implementation party and Placer County for use in preparation of the County's Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP).	
Himalayan blackberry shall occur in no greater than 25% of the riparian understory within each watershed.	Annually
Wildlife/Fisheries Population Enhancement and Establishment Guidelines	
All species occurrences within the restoration site shall be recorded. A list identifying species observed shall be submitted to the implementation party and Placer County for use in preparation of the County's Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP).	Quarterly
Population surveys for Chinook salmon and steelhead shall be conducted for every stream-associated restoration site. Sampling locations and species occurrences shall be recorded using GIS and shall be submitted in digital format to the implementation party and Placer County for use in preparation of the NCCP/HCP.	Annually
Nesting bird surveys shall be conducted during nesting season (March-August). Nesting occurrences shall be recorded using GIS and shall be submitted in digital format to the implementation party and Placer County for use in preparation of the NCCP/HCP.	Two times per nesting season
Conduct focused surveys for Key Species within each restoration site. Species occurrences shall be recorded using GIS and shall be submitted in digital format to the implementation party and Placer County for use in preparation of the NCCP/HCP.	Annually

Data Quality Assurance and Quality Control

When collecting and analyzing data samples it is essential to ensure, to the highest degree possible, that the data is analyzed accurately. Quality Assurance and Quality Control (QAQC) refers to a method of carefully analyzing data to guarantee that the results are assured to be accurate within acceptable limits and recognized standards. All monitoring data taken as a result of individual project implementation shall follow QAQC standards. Additionally, a Quality Assurance Project Plan (QAPP) shall be prepared to ensure that data is analyzed accurately.

Adaptive Management

Adaptive management is the systematic acquisition and application of reliable information to improve management over time. This method of management encourages the continual collection of data for the purposes of feedback into the management system. Adaptive management has several key and obligatory steps that include a clear statement of management goals and objectives, conceptual models that explore policy alternatives, targeted research to provide necessary knowledge, selection of appropriate indicators for monitoring, monitoring of indicators, assessment of management effectiveness, and a clear connection between data and further management actions. The adaptive management method takes into account changing land uses, ecological processes, human activities, environmental conditions, land management practices, and numerous other changing conditions and allows for alterations in management based on the results of new information.

Adaptive management methodologies shall be incorporated into the monitoring and management of restoration projects wherever appropriate to ensure that objectives are met over time given changes in observed conditions, changes in long-term environmental trends affecting the project, changes in the body of scientific knowledge, etc.